



Department of Biological Sciences  
Montana Tech

# **Native-Plant Restoration Project**

**Year 4 Annual Plan**  
**January 1, 2016 - December 31, 2016**

Prepared by

Robert Pal and Krystal Weilage



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*The Project Sponsor proposes to perform the following tasks during Project Year 4 (through December 31, 2016) in order to accomplish the objectives.*

***1. Coordinate with stakeholders to select priority planting and optimize project impact***

Coordinate with NRDP, BSB, DEQ, and BNRC to identify planting locations and opportunities. A representative of Montana Tech and this project will attend and participate in all meetings held to coordinate this project with stakeholders and regulators and report to NRDP and BNRC. Information gained from the meetings will guide priorities for 2016 and the development of the Year 5 (2017) plan.

***2. Improve planting approach and applied techniques***

Learning from the monitoring work performed through the summer of 2015, we made several adjustments in our planting approach. It became clear that the success of the seed dispersal islands was highly impacted by the surrounding Eurasian grass species (especially crested wheatgrass). Therefore, we (Montana Tech and Butte Silver Bow) proposed a seed mix for the EPA that contained only native seeds. For the species composition of the seed mix, we took into consideration the results of our reference sites that listed the most common native (mainly grass) species in the Butte area. The seed mix (Pal 2015) was approved by EPA, therefore, in this coming season we can work with it. In our 2016 plans we will be working with larger sites, scraping the exotic grasses off the surface (only at a size that would not increase erosive processes) to decrease competition in the establishments the new native seedlings. The sites will then be seeded in early spring by the newly approved seed mix (with the help of Butte Silver Bow). In the future we plan to create spreading gateways for seed near the established sites.

In August of 2015 the Native Plant Project had an audit by Len Ballek from Herrera Environmental Consultants, Inc. His suggestions were the following:

- Eliminate the use of “Vegetated Mats”
- Focus on standard reclamation techniques
- Fully develop a GIS/Reference site tool to guide future planting efforts
- Provide a complete seed and plant inventory to all project sponsors
- Reduce species list
- Work to keep growing facility fully utilized

Based on his suggestions further alterations were made in our future plans. We eliminated the forb mats from our techniques and will only use them in special circumstances, where a quick and more ornamental cover is required. We will focus on the standard reclamation techniques at all of our new sites.

Mark Mariano, a grad student in the Restoration Ecology program, has started to develop a GIS tool that we will be able to use in our future planting efforts. With the model we will characterize site conditions and tailor the species composition accordingly. We prepared our required inventories (see appendix) and have shared them with the project sponsors.

His suggestion was also to work with fewer but more successful species. We are cutting back on the number of grown species and will, instead, work on the more successful natives. Following Mr. Ballek’s suggestions, we will be working with more woody species, especially junipers. Therefore, we have already started to collect and grow thousands of cuttings from *Juniperus communis* (Common Juniper), *Juniperus scopulorum* (Rocky Mountain Juniper), *Juniperus horizontalis*

(Creeping Juniper) that we plan to plant out in 2016, and also increase our permanent collection in the seed orchard.

According to the plans for 2016 the greenhouse will be completely full and continually all growing facilities will be working fully utilized.

Len Ballek suggested a closer collaboration with Butte Silver Bow and Norm DeNeal in our plantings. We have already started to work closely with Butte Silver Bow on our plans for 2016 and will perform all plantings as a collaboration. We are also working together with Norm DeNeal on the germination of several native plant species for his project.

It was also suggested that we should participate in a couple of training events on restoration. We are already signed up for the 2016 ASMR Conference 33rd Annual Meeting of the American Society of Mining & reclamation June 4th to 9<sup>th</sup>. We also plan to participate the highly recommended US Forest Service Region One Soil Bioengineering/Native Plant Revegetation Training.

### ***3. Monitor the success of earlier sites***

Continuous monitoring of the earlier planting sites is crucial for the success of the project. We will visit the earlier sites and record survival and spreading of the installed native plants.

### ***4. Locate and survey further reference sites in native vegetation around Butte.***

Native reference sites would help us to identify the best species composition and the ratio of best performing plants at different habitats and aspects, so that the new sites will meet the criteria for a successful restoration. During the growing season we will locate numerous undisturbed and native-plant-covered reference sites in every aspect (south facing dry slopes, hill tops, and north facing more mesic sites). At each site we will conduct five 1 × 1 m vegetation plots, where we record the plant species present and their coverage. We will evaluate different habitats (with different ecological conditions) separately and as a final result we will provide a species list for possible site conditions that are characteristic of the Butte area. At the surveyed reference sites we will also be able to perform seed collection for the restoration project.

### ***5. Maintain and expand the seed orchard on the Montana Tech Campus.***

The expansion of the orchard will accommodate more shrub species and a greater variety of forbs. Seed collection will continue this summer in the seed orchard.

#### *Maintaining seed/forb orchard:*

- Weeding primarily involves maintaining the edges free from grass encroachment. The general area requires occasional mowing and weed whacking.
- Watering is on a timer but must be checked regularly according to environmental conditions and to check for necessary repairs.

Plants in cold sheds and nursery will be cared for and handled appropriately:

The plants that are sown into containers from treated seeds are moved outside to the nursery early in the spring to harden and acclimatize. During the winter months (mid Nov – April) those plants not used at planting sites are moved inside the cold sheds, insulated with sawdust, and covered with frost cloth (as needed). The plants must be watered occasionally during the winter even though they are dormant.

Approximately 2000 plants from previous years in various size pots have been over-wintered. In 2015 we intend to plant enough to replace the number planted, so the inventory at the start of next year (January 2016) would be at least 2000. All plants over 3 years old must be planted in 2015, since the older the plant becomes, the less likely the plant is to survive overwintering. There should be a turnover every 3 years, so that no plants stored at Montana Tech are more than 3 years old.

***6. Operate and maintain the Montana Tech greenhouse.***

The greenhouse will function as the center of seed and plant management. Collected seeds will be dried, cleaned and stored for future use. Cleaned seeds are stored in sealed Ziploc bags which are then refrigerated at approximately 40 degrees F. Of the approximately 85 species of forbs and approximately 26 species of shrubs, all but 25 forb species and 4 shrub species require treatment before they will germinate. The number of species and the amount of each species needed for the year will be determined, so that the seeds can be treated to initiate germination, if necessary. Seedlings will be grown in the greenhouse until they are mature enough to be hardened outside. "Conetainers" are tubes of various sizes within which treated seeds grow into individual plants for the project.

The greenhouse will be cleaned, operated routinely and maintained in functioning condition. The hoop house has been completed and will be put into operation this spring, so that we will have the ability to increase our productivity as needed.

***7. Maintain earlier planting sites and propagate native plants for use in ecological restoration in Butte Area One***

a. *Maintain dispersal islands until some degree of self-sufficiency is established.*

The initial watering that the new dispersal islands require will be performed by BSB, where necessary, using watering devices at the same time they water their nearby plantings. This coordination will reduce labor time and costs to establish the plantings. Weeding will be performed by Montana Tech as needed.

b. *Propagate native plants on sites identified by NRDP and BSB. The following sites will be planted in 2016 (detailed site improvement plans are attached):*

- Alabama Street between Waukesha and Lewisohn Streets
- Anselmo Timber Yard Slope & BA&P Trail
- BA&P Trail at Montana Street; BA&P Trail at Main Street
- Stormwater Inlet at Clark between Copper and Quartz, south of Scown field
- Original Mine Yard
- Anselmo Mine Yard
- Travona Dump
- Washoe Dump
- West Gagnon Dump

Planting efforts will be performed in a strong collaboration with BSB. Site preparation and grass seeding will be done by BSB early spring. Sites will be scraped off, seeded in, and bigger containerized plants (1-5 gallons) will be added by BSB. Native Plant Program helps in the species selection for both seeded grasses, and bigger containerized plants. Native plant

program will plant containerized native plants (trees, shrubs, forbs) mainly in the fall to the same sites. We try to avoid mid-summer planting, this way watering can be minimized.

***8. Promote stewardship among the community and make information about this project available locally by attending and presenting information at community meetings and symposiums and by preparing outreach materials.***

The planting of the West Gagnon Dump will be a community planting project to celebrate Arbor and Earth Days. Montana Tech Native Plant Program (MTNPP), Butte-Silver Bow (BSB), MSU Extension, and the AmeriCorps Energy Corps have partnered to bring this project to the community. The plantings intended for this site mitigate sediment erosion from the Site into Washington and Jackson Streets by reinforcing the Site's vegetative cover with native plants, grasses and forbs.

## Appendix:

### Plant inventory

#### OVERWINTERING PLANTS 2015-2016

<b>SHRUBS</b>			
<b>Genus</b>	<b>species</b>	<b>Size</b>	<b>Number</b>
<i>Artemisia</i>	<i>tridentata</i>	3 G	2
<i>Artemisia</i>	<i>tridentata</i>	40 I	33
<i>Cercocarpus</i>	<i>ledifolius</i>	40 I	13
<i>Chrysothamnus</i>	<i>viscidiflorus</i>	10 I	15
<i>Ericameria</i>	<i>nauseosa</i>	10 I	30
<i>Philadelphus</i>	<i>lewisii</i>	40 I	2
<i>Pseudotsuga</i>	<i>menziesii</i>	3 G	11
<i>Pseudotsuga</i>	<i>menziesii</i>	1 G	13
<i>Pseudotsuga</i>	<i>menziesii</i>	40 I	5
<i>Ribes</i>	<i>aureum</i>	40 I	40
<i>Rosa</i>	<i>woodsii</i>	40 I	34
<i>Shepherdia</i>	species	40 I	53
<i>Sorbus</i>	<i>scopulina</i>	3 G	10
<i>Sorbus</i>	<i>scopulina</i>	1 G	9
<i>Sorbus</i>	<i>scopulina</i>	10 I	24
<i>Tetradymia</i>	<i>canescens</i>	10 I	3
<b>Total</b>			<b>297</b>

<b>GRASS</b>			
<b>Genus</b>	<b>species</b>	<b>Size</b>	<b>Number</b>
<i>Danthonia</i>	<i>unispicata</i>	10 I	47
Grass	species 1	10 I	54
Grass	species 2	10 I	20
Grass	species 3	4 I	155
Grass	species 4	4 I	124
Grass	species 5	4 I	140
<i>Poa</i>	<i>secunda</i>	10 I	34
<i>Stipa</i>	<i>comata</i>	10 I	6
<i>Stipa</i>	<i>comata</i>	4 I	3
<i>Stipa</i>	<i>viridula</i>	10 I	13
<b>Total</b>			<b>596</b>

#### NONNATIVE

<i>Salix</i>	species		24
<i>Malus</i>	species		46
<b>Total</b>			<b>70</b>

<b>FORBS</b>			
<b>Genus</b>	<b>species</b>	<b>Size</b>	<b>Number</b>
<i>Achillea</i>	<i>millefolium</i>	10 I	34
<i>Agoseris</i>	<i>glauca</i>	10 I	28
<i>Allium</i>	<i>cernuum</i>	10 I	125
<i>Allium</i>	<i>textile</i>	10 I	14
<i>Antennaria</i>	<i>microphylla</i>	10 I	45
<i>Apocynum</i>	<i>androsaemifolium</i>	10 I	14
<i>Arnica</i>	<i>cordifolia</i>	10 I	126
<i>Artemisia</i>	<i>ludoviciana</i>	1 G	14
<i>Artemisia</i>	<i>ludoviciana</i>	40 I	1
<i>Artemisia</i>	<i>ludoviciana</i>	10 I	50
<i>Artemisia</i>	<i>frigida</i>	10 I	24
<i>Astragalus</i>	<i>atropubescens</i>	40 I	5
<i>Astragalus</i>	<i>atropubescens</i>	10 I	28
<i>Astragalus</i>	Frank	10 I	42
<i>Astragalus</i>	species	10 I	28
<i>Balsamorhiza</i>	<i>sagitatta</i>	10 I	8
<i>Castilleja</i>	species	10 I	39
<i>Comandra</i>	<i>umbellatum</i>	10 I	14
<i>Draba</i>	species	10 I	17
<i>Erigeron</i>	<i>compositus</i>	10 I	28
<i>Eriogonium</i>	<i>umbellatum</i>	10 I	28
<i>Erythronium</i>	<i>grandiflorum</i>	10 I	98
<i>Gaura</i>	<i>coccinea</i>	10 I	37
<i>Geranium</i>	<i>viscosissimum</i>	10 I	49
<i>Geum</i>	species	10 I	9
<i>Geum</i>	<i>triflorum</i>	10 I	49
<i>Grindelia</i>	<i>squarrosa</i>	10 I	64
<i>Heterotheca</i>	<i>villosa</i>	10 I	106
<i>Iris</i>	<i>missouriensis</i>	10 I	7
<i>Lithospermum</i>	<i>ruderae</i>	10 I	29
<i>Packera</i>	<i>cana</i>	10 I	133
<i>Penstemon</i>	<i>procerus</i>	10 I	111
<i>Penstemon</i>	<i>nitidus</i>	10 I	73
<i>Penstemon</i>	<i>aridus</i>	10 I	28
<i>Penstemon</i>	<i>eriantherus</i>	10 I	11
<i>Penstemon</i>	<i>eatonii</i>	10 I	43
<i>Polemonium</i>	<i>pulcherrimum</i>	10 I	30
<i>Potentilla</i>	<i>gracilis</i>	10 I	14
<i>Potentilla</i>	<i>pensylvanica</i>	10 I	14
<i>Solidago</i>	<i>missouriensis</i>	10 I	54

<i>Symphyotrichum</i>	<i>oblongifolium</i>	10 I	2
<i>Symphyotrichum</i>	<i>occidentalis</i>	40 I	8
<i>Symphyotrichum</i>	<i>occidentalis</i>	10 I	81
Unknown	species 1	10 I	4
Unknown	species 2	10 I	4
Unknown	species 3	10 I	3
<i>Zigadenus</i>	species	10 I	41
		<b>Total</b>	<b>1814</b>

## SEED COLLECTION 2015 SPECIES LIST

<b>Forbs</b>	
<b>Genus</b>	<b>species</b>
1	<i>Achillea millefolium</i>
2	<i>Agoseris glauca</i>
3	<i>Allium cernuum</i>
4	<i>Antennaria microphylla</i>
5	<i>Arenaria congesta</i>
6	<i>Artemisia ludoviciana</i>
7	<i>Artemisia frigida</i>
8	<i>Aster</i> species
9	<i>Astragalus alpina</i>
10	<i>Astragalus atropubescens</i>
11	<i>Astragalus canadensis</i>
12	<i>Astragalus crassicaarpus</i>
13	<i>Astragalus</i> species
14	<i>Balsamorhiza sagittata</i>
15	<i>Besseya wyomingensis</i>
16	<i>Boechera holboellii</i>
17	<i>Campanula rotundifolia</i>
18	<i>Chaenactis douglasii</i>
19	<i>Cirsium undulatum</i>
20	<i>Comandra umbellata</i>
21	<i>Cryptantha interrupta</i>
22	<i>Delphinium bicolor</i>
23	<i>Dodecatheon pulcellum</i>
24	<i>Douglasia montana</i>
25	<i>Epilobium angustifolium</i>
26	<i>Erigeron compositus</i>

27	<i>Eriogonum</i>	<i>flavum</i>
28	<i>Eriogonum</i>	<i>ovalifolium</i>
29	<i>Eriogonum</i>	<i>umbellatum</i>
30	<i>Erythronium</i>	<i>grandiflorum</i>
31	<i>Gaillardia</i>	<i>aristata</i>
32	<i>Gaura</i>	<i>coccinea</i>
33	<i>Geranium</i>	<i>viscosissimum</i>
34	<i>Geum</i>	<i>triflorum</i>
35	<i>Gilia</i>	<i>aggregata</i>
36	<i>Grindelia</i>	<i>squarrosa</i>
37	<i>Hedysarum</i>	<i>boreale</i>
38	<i>Heterotheca</i>	<i>villosa</i>
39	<i>Heuchera</i>	<i>cylindrica</i>
40	<i>Hymenoxys</i>	<i>acaulis</i>
41	<i>Iris</i>	<i>missouriensis</i>
42	Legume	species
43	<i>Lewisia</i>	<i>rediviva</i>
44	<i>Linum</i>	<i>lewisii</i>
45	<i>Lithospermum</i>	<i>ruderales</i>
46	<i>Lomatium</i>	<i>triternatum</i>
47	<i>Lupinus</i>	<i>sericeus</i>
48	<i>Mentzelia</i>	<i>laevicaulis</i>
49	<i>Mertensia</i>	<i>oblongifolia</i>
50	<i>Oenothera</i>	<i>biennis</i>
51	<i>Opuntia</i>	<i>polyacantha</i>
52	<i>Oxytropis</i>	<i>lagopus</i>
53	<i>Packera</i>	<i>cana</i>
54	<i>Penstemon</i>	<i>aridus</i>
55	<i>Penstemon</i>	<i>eriantherus</i>
56	<i>Penstemon</i>	<i>procerus</i>
57	<i>Penstemon</i>	species
58	<i>Phacelia</i>	<i>hastata</i>
59	<i>Phlox</i>	<i>longifolia</i>
60	<i>Phlox</i>	<i>muscoides</i>
61	<i>Polemonium</i>	<i>pulcherrimum</i>
62	<i>Potentilla</i>	<i>gracilis</i>
63	<i>Potentilla</i>	<i>pennsylvanica</i>
64	<i>Potentilla</i>	species
65	<i>Sedum</i>	<i>lanceolatum</i>
66	<i>Solidago</i>	<i>missouriensis</i>
67	<i>Solidago</i>	<i>gigantea</i>

68	Sphaeralcea	coccinea
69	Symphotrichum	occidentale
70	Thalictrum	occidentale
71	Thermopsis	montana

<b>Shrubs/Trees</b>		
	<b>Genus</b>	<b>species</b>
72	<i>Arctostaphylos</i>	<i>uva-ursi</i>
73	<i>Artemisia</i>	<i>tridentata</i>
74	<i>Chrysothamnus</i>	<i>viscidiflorus</i>
75	<i>Dasiphora</i>	<i>fruticosa</i>
76	<i>Ericameria</i>	<i>nauseosa</i>
77	<i>Juniperus</i>	<i>communis</i>
78	<i>Pinus</i>	<i>ponderosa</i>
79	<i>Prunus</i>	<i>virginiana</i>
80	<i>Pseudotsuga</i>	<i>menziesii</i>
81	<i>Purshia</i>	<i>tridentata</i>
82	<i>Ribes</i>	<i>americanum</i>
83	<i>Ribes</i>	<i>aureum</i>
84	<i>Rubus</i>	<i>idaeus</i>
85	<i>Sambucus</i>	species
86	<i>Spiraea</i>	<i>betulifolia</i>
87	<i>Tetradymia</i>	<i>canescens</i>

<b>Grass</b>		
	<b>Genus</b>	<b>species</b>
88	<i>Carex</i>	<i>exserta</i>
89	<i>Danthonia</i>	<i>unispicata</i>
90	<i>Festuca</i>	<i>campestris</i>
91	<i>Juncus</i>	<i>balticus</i>
92	<i>Koeleria</i>	<i>cristata</i>
93	<i>Leymus</i>	<i>cinereus</i>
94	<i>Oryzopsis</i>	<i>hymenoides</i>
95	<i>Pseudoroegneria</i>	<i>spicata</i>
96	<i>Stipa</i>	<i>comata</i>
97	<i>Stipa</i>	species
98	<i>Stipa</i>	<i>viridula</i>

## **Butte Area One Native Plant Diversity Site Improvement Plan**

**Site Name:** Alabama Street between Waukesha and Lewisohn Streets      **Date:** 01/01/2016

**Site Location/Size:** The site is located north and west of the intersection of Antimony and Lewisohn Streets at Alabama. The site will consist of three pods, two dry and one wet site (see map below).

**GPS:** 46 01 08.38 N; 112 32 50.22 W

**BRES Site #/Name:** Located West of Site No. 71N, Anselmo Timber Yard Slope; South of Site No. 1503 Hornet Addition, and within Missoula Gulch Drainage

**BSB Zoning Classification(s) at Site:** Zoned R2, low-density two family residential

**Vegetative Deficiencies/Problems at this Site:** The planting targets are adjacent to several BRES sites located in the vicinity of the Anselmo Mine and Missoula Gulch. Missoula Gulch drainage system is the major conveyance structure for stormwater east of Montana Street. Volumes of water are collected on either side of Missoula Gulch and are transported to Catch Basins 8 and 9 where water is retained to allow sediments to fall away from the water prior to arrival at Lower Area One Butte Treatment Lagoons. Stormwater carrying metal laden sediments are a primary source of metals loading to Silver Bow Creek.

This planting is intended to take advantage of three sites where erosion is particularly evident. Stormwater flowing from the Hornet Addition (Site No. 1503) carries significant sediments which enter a drop structure on Alabama Street, however many of those sediments do not fall out and sheet flow over curbs in the area unsettling sediments on the three target sites. These sediments erode into Missoula Gulch and are carried toward Silver Bow Creek through the stormwater system.

Besides plant species composition does not represent local, native species diversity. Mainly monocultures of Eurasian grass species and exotic weeds are present.

**Proposed Efforts to Improve the Site:** The plantings intended for this site mitigate sediment erosion into Missoula Gulch by establishing a vegetative cover of native plants and trees. The plantings will be placed in three areas; the first planting area is a gulch (slightly North East facing); the second an east facing slope within a drainage suitable for wet-area species; the third is a rock outcrop on a south facing slope.

### **Site A. Gulch - suitable for wet environment species.**

Montana Tech Native Plant Program (MTNPP) intends to plant 300 native shrubs, forbs and grasses. Shrubs include *Salix* species (Willow), *Prunus virginiana* (Chokecherry), *Ribes aureum* (Golden Currant), *Sorbus scopulina* (Mountain Ash), and *Shepherdia* species (Buffalo Berry). Forb species include *Solidago canadensis* (Canada Goldenrod), *Geum macrophyllum* (Large-leaf Avens), *Helianthus maximillianii* (Maximillian's Sunflower), *Penstemon procerus* (Ballhead Penstemon), *Polemonium pulcherrimum* (Jacobs-ladder), and *Geranium viscosissimum* (Sticky Geranium). Grass seeds in this area include *Deschampsia caespitosa* (Tufted Hairgrass), *Elymus*

*trachycaulus* (Slender Wheatgrass), and *Festuca scabrella* (Rough Fescue). Butte-Silver Bow Planning Department, Superfund Division (BSB) will assist with site preparation in early spring and MTNPP will hand seed grass species tailored for wet areas and will plant shrubs and forbs in the fall. This will allow the grasses time to establish, and create a native habitat that will support successful proliferation of native forbs and shrubs.



**Site A. Surface needs to be scraped off before any intervention by **Butte-Silver Bow (BSB)** Planting by **Montana Tech Native Plant Program (MTNPP)** 300 shrubs and forbs + hand seeded grass.**

**Site B. North East facing slope suitable for dry land species.**

Similar to Site A, Butte-Silver Bow will scrape a 3x10m surface to accommodate the planting of 300 forbs and 50 shrubs. Following scraping, Butte-Silver Bow will seed with the EPA approved 2015 Pal Mix in early spring. Grasses will have the summer to establish, and in the fall Montana Tech Native Plant Program will hand prepare the site to plant shrub species including common juniper (*Juniperus communis*) and Rocky mountain juniper (*Juniperus scopulorum*). Forb species planned include *Lewisia rediviva* (Bitterroot), *Eriogonum umbellatum* (Sulfur-flower Buckwheat), *Allium cernuum* (Nodding Onion), *Epilobium angustifolium* (Fireweed), *Geum triflorum* (Old Man's Whiskers), *Astragalus crassicaarpus* (Groundplum Milkvetch), *Arnica* species (Arnica), *Heuchera cylindrica* (Round-leaf Alumroot), *Phlox longifolia* (Long-leaf Phlox), *Agoseris glauca* (False Mountain Dandelion), *Penstemon procerus* (Ballhead Penstemon), *Polemonium pulcherrimum* (Jacob's Ladder), *Geranium viscosissimum* (Sticky Geranium). Additionally, the grass seeds will augment forb species including *Linum lewisii* (Lewis' Flax), *Artemisia ludoviciana* (White Sage), *Arabis holboellii* (Holboell's Rockcress), *Antennaria microphylla* (Pussytoes), *Coreopsis tinctoria* (Plains Coreopsis), *Erigeron compositum* (Cut-leaf Daisy).

In addition to Montana Tech Native Plant Program plantings, Butte-Silver Bow will install larger native trees (20 individuals) such as non-irrigated mountain ash or aspen trees along a user-defined trail from the Northside Neighborhood to the BA&P Trail to provide visual interest, shade, and additional sediment control in the area. This will require the excavation and creation of individual planting pods for trees with clean soils, pending sampling and analysis of existing soils in the area.



**Site B.**

**Yellow:** BSB tree planting 20 trees

**Red:** Montana Tech Native Plant Program sites (300 forbs and 50 shrubs)

**Site C. East and South facing sites suitable for dry land species.** The east facing site is barren with rock outcrops and with significant erosion of decomposed granite. Many rock outcrops throughout the BPSOU are home to volunteer plants finding hospitable environments for growth. Butte-Silver Bow will clear hydruseed (Pal 2015 Mix) the site to make way for installation of 200 forbs and 20 shrubs in fall of 2016 by MTNPP.

The south facing site is a Eurasian grass covered dry slope. Butte-Silver Bow will clear a 3x10 m surface and seed (Pal 2015 Mix – MTNPP will enhance the seed mix with the seeds of suitable forbs such as *Linum lewisii* (Lewis' Flax), *Artemisia ludoviciana* (White Sage), *Arabis holboellii* (Holboell's Rockcress), *Antennaria microphylla* (Pussytoes), *Coreopsis tinctoria* (Plains Coreopsis), *Erigeron compositus* (Cutleaf Daisy), *Achillea millefolium* (Yarrow)) the site to make way for installation of 300 forbs and 50 shrubs in fall of 2016 by MTNPP.

The Species include common juniper (*Juniperus communis*), creeping juniper (*Juniperus horizontalis*), mountain mahogany (*Cercocarpus ledifolius*), and Rocky mountain juniper (*Juniperus scopulorum*). Forbs specified include *Allium cernuum* (Nodding Onion), *Epilobium angustifolium* (Fireweed), *Arenaria congesta* (Ballhead Sandwort), *Artemisia frigida* (Fringed Sage), *Aster occidentalis* (Western Mountain Aster), *Astragalus atropubescens* (Hangingpod Milkvetch), *Balsamorhiza sagittata* (Arrowleaf Balsamroot), *Oxytropis lagopus* (Rabbitsfoot Locoweed), *Eriogonum ovalifolium* (Cushion Buckwheat), *Lupinus* species (Lupine), *Grindelia squarrosa* (Curlycup Gumweed), *Heterotheca villosa* (Hairy Goldenaster), *Hymenoxys acaulis* (Stemless Four-nerve Daisy), *Lithospermum ruderae* (Puccoon), *Mentzelia laevicaulis* (Smoothstem Blazingstar), *Oenothera biennis* (Common Evening Primrose), *Penstemon eriantherus* (Fuzzytongue Penstemon), *Phlox muscoides* (Hood's Phlox), *Phacelia hastata* (Silky Phacelia), *Potentilla gracilis* (Slender Cinquefoil), *Potentilla pensylvanica* (Pennsylvania Cinquefoil), *Solidago missouriensis* (Missouri Goldenrod), *Sedum lanceolatum* (Spearleaf Stonecrop), *Geum triflorum* (Old Man's Whiskers), *Astragalus crassicaarpus* (Groundplum Milkvetch), *Arnica* species (Arnica), *Heuchera cylindrica* (Roundleaf Alumroot), *Phlox longifolia* (Longleaf Phlox), *Agoseris glauca* (False Mountain Dandelion).



### Site C.

**BSB** prepares and seeds in sites

**MTNPP** plantings (E: 200 forbs and 20 shrubs, S: 300 forbs and 50 shrubs)

The project scope of work is as follows:

- Spring 2016 (February/March/April)
  - A. BSB to Release Request for Quotes to procure vegetation to augment MTNPP plants
  - B. BSB to Prepare Planting Areas
  - C. BSB to Seed and Hydroseed Planting Areas
  - D. Butte-Silver Bow to install larger trees (April)
  - E. MTNPP hand seeds some sites
- Fall 2016 (September/October)
  - F. MTNPP hand preparation for installation of forbs and shrubs
  - G. MTNPP to plant forbs and shrubs

**Efforts to Co-ordinate with other Entities:** Montana Tech Native Plant Program and Butte-Silver Bow Superfund Division have partnered in this effort collaboratively. Site visits have been conducted in tandem and plans for sites have been developed to minimize duplicate expenditures and maximize investment of Butte Natural Resource Damage grant funds for both the Native Plant and Butte Hill Tree planting programs. Butte-Silver Bow has agreed to prepare sites for Montana Tech, seed the sites with the EPA approved native seed mix, and assist where necessary. Butte-Silver Bow has committed funds to procuring larger vegetation to augment MTNPP plants and maximize sediment control measures on sites.

**Materials and Labor Estimate: Materials:** 1320 containers of forbs and shrubs, 3 ounces native seed. Labor estimate for planting: 132 hrs

**Estimated Cost:** \$26,400 (including collection of seeds and cuttings, cleaning seeds, preparation/propagation of plants, planting, and maintaining)

**Proposed Start Date:** Fall 2016 Proposed Evaluation Date: June 2018

**Submitted by:** Montana Tech Native Plant Program



**Map for Alabama & Lewishon planting**

## **Butte Area One Native Plant Diversity Site Improvement Plan**

**Site Name:** Anselmo Timber Yard Slope & BA&P Trail

**Date:** 01/01/2016

**Site Location/Size:** The planting targets are located at the Anselmo Timber Yard Slope, which is located north of the BA&P Trail, South of Empire Street, and West of Boardman Street. The site will consist of two planting areas; one, a rock outcrop along the trail, and another, the south west facing eastern portion of the site (see map below).

**GPS:** 46 01 09.29 N; 112 32 44.70 W 46 01 08.72 N; 112 32 39.04 W

**BRES Site #/Name:** Site No. 71N, Anselmo Timber Yard Slope;  
Site No. 2330 BA&P Trail Section A

**BSB Zoning Classification(s) at Site:** Site No. 71N is OSC Open Space Conservation  
Site No. 2330 is zoned OSD Open Space Developable

**Vegetative Deficiencies/Problems at this Site:** The Anselmo Timber Yard Slope (Site No. 71N) was evaluated in 2014 by independent contractors. The vegetation and erosion evaluation revealed the site required significant vegetation improvement. The site sustained significant edge variation including presence of weeds, erosion, poor vegetative cover, steep slopes, barren areas, land slumps, and exposed waste. The barren areas were covered with top soil and seeded with the EPA-approved Butte Hill seed mix. Areas of exposed waste were removed, covered with lime rock, and capped per the Butte Hill Re-vegetation Specifications.

Plant species composition does not represent local, native species diversity. Mainly monocultures of Eurasian grass species and exotic weeds are present.

The site's steep slope challenges the integrity of the site, and stormwater run-off from Jackson Street/Boardman causes significant erosion forming gullies and rills. To correct these issues and augment the BSB Crew work, Montana Tech Native Plant Program and Butte-Silver Bow Butte Hill Tree Program will plant forbs and shrubs in the area to hold the slopes intact. In addition, along the BA&P Trail an existing rock outcrop has significant decomposed granite eroding into the trail corridor. Strategic plantings of native forbs will hold these sediments in place and create habitat for plants which find this area welcoming.

**Proposed Efforts to Improve the Site:** The plantings intended for this site mitigate sediment erosion from the Site into Missoula Gulch by establishing a vegetative cover of native grass, forbs, shrubs and trees. Two planting areas are targeted; one, the eastern portion of the site along Boardman and Jackson Streets, and the rock outcrop along the trail.

### **Site A. South Facing Rock Outcrop.**

This site will not be prepared by Butte-Silver Bow, rather the Montana Tech Native Plant Program (MTNPP) intends to hand seed this area with grasses and forbs in spring of 2016 to allow the grasses and plants to establish over the course of the summer. These plants are *Festuca idahoensis* (Idaho Fescue), *Poa sandbergii* (Sandberg's Bluegrass), *Festuca scabrella* (Rough

Fescue), *Linum lewisii* (Lewis' Flax), *Artemisia ludoviciana* (White Sage), *Arabis holboellii* (Holboell's Rockcress), *Antennaria microphylla* (Pussytoes), *Coreopsis tinctoria* (Plains Coreopsis), *Erigeron compositus* (Cutleaf Daisy), *Achillea millefolium* (Yarrow). In fall of 2016, the program will augment grasses and forbs with more mature plants from the greenhouse. Approximately 100 forbs and 10 shrubs in this area will be installed. The shrub species selected for this area include common juniper (*Juniperus communis*) and mountain mahogany (*Cercocarpus ledifolius*). Forb species include *Allium cernuum* (Nodding Onion), *Epilobium angustifolium* (Fireweed), *Arenaria congesta* (Ballhead Sandwort), *Artemisia frigida* (Fringed Sage), *Aster occidentalis* (Western Mountain Aster), *Astragalus atropubescens* (Hangingpod Milkvetch), *Balsamorhiza sagittata* (Arrowleaf Balsamroot), *Oxytropis lagopus* (Rabbitsfoot Locoweed), *Eriogonum ovalifolium* (Cushion Buckwheat), *Lupinus* species (Lupine), *Grindelia squarrosa* (Curlycup Gumweed), *Heterotheca villosa* (Hairy False Goldenaster), *Hymenoxys acaulis* (Stemless Four-nerve Daisy), *Lithospermum ruderae* (Puccoon), *Mentzelia laevicaulis* (Smoothstem Blazingstar), *Oenothera biennis* (Common Evening Primrose), *Penstemon eriantherus* (Fuzzytongue Penstemon), *Phlox muscoides* (Hood's Phlox), *Phacelia hastata* (Silky Phacelia), *Potentilla gracilis* (Slender Cinquefoil), *Potentilla pensylvanica* (Pennsylvania Cinquefoil), *Solidago missouriensis* (Missouri Goldenrod), *Sedum lanceolatum* (Spearleaf Stonecrop), *Geum triflorum* (Old Man's Whiskers), *Astragalus crassicaarpus* (Goundplum Milkvetch), *Arnica* species (Arnica), *Heuchera cylindrica* (Roundleaf Alumroot), *Phlox longifolia* (Longleaf Phlox), *Agoseris glauca* (False Mountain Dandelion).

**Site B. South West facing slope, eastern edge of Site No. 71N.**

Butte-Silver Bow will scrape two areas measuring approximately 3x10m and seed in the area with the 2015 EPA-approved Pal mix of native species. Additionally, to the grass species forb seeds such as *Linum lewisii* (Lewis' Flax), *Artemisia ludoviciana* (White Sage), *Arabis holboellii* (Holboell's Rockcress), *Antennaria microphylla* (Pussytoes), *Coreopsis tinctoria* (Plains Coreopsis), *Erigeron compositus* (Cutleaf Daisy), *Achillea millefolium* (Yarrow) will be incorporated. Within these stripes, MTNPP will plant 300 forbs and 100 shrubs per stripe for a total of 600 forbs and 200 shrub species (in the fall of 2016). Shrub species include *Juniperus communis* (Common Juniper), *Juniperus scopulorum* (Rocky Mountain Juniper), *Cercocarpus ledifolius* (Curleaf Mountain Mahogany), *Artemisia tridentata* (Big Sagebrush), *Chrysothamnus nauseosus* (Rubber Rabbitbrush). Forb species are *Allium cernuum* (Nodding Onion), *Epilobium angustifolium* (Fireweed), *Arenaria congesta* (Ballhead Sandwort), *Artemisia frigida* (Fringed Sage), *Aster occidentalis* (Western Mountain Aster), *Astragalus atropubescens* (Hangingpod Milkvetch), *Balsamorhiza sagittata* (Arrowleaf Balsamroot), *Oxytropis lagopus* (Rabbitsfoot Locoweed), *Eriogonum ovalifolium* (Cushion Buckwheat), *Lupinus* species (Lupine), *Grindelia squarrosa* (Curlycup Gumweed), *Heterotheca villosa* (Hairy False Goldenaster), *Hymenoxys acaulis* (Stemless Four-nerve Daisy), *Lithospermum ruderae* (Puccoon), *Mentzelia laevicaulis* (Smoothstem Blazingstar), *Oenothera biennis* (Common Evening Primrose), *Penstemon eriantherus* (Fuzzytongue Penstemon), *Phlox muscoides* (Hood's Phlox), *Phacelia hastata* (Silky Phacelia), *Potentilla gracilis* (Slender Cinquefoil), *Potentilla pensylvanica* (Pennsylvania Cinquefoil), *Solidago missouriensis* (Missouri Goldenrod), *Sedum lanceolatum* (Spearleaf

Stonecrop), *Geum triflorum* (Old Man's Whiskers), *Astragalus crassicaarpus* (Groundplum Milkvetch), *Arnica* species (Arnica), *Heuchera cylindrica* (Roundleaf Alumroot), *Phlox longifolia* (Longleaf Phlox), *Agoseris glauca* (False Mountain Dandelion).



#### Site A and B

**BSB** prepares and seeds in sites

**MTNPP** plantings (A: 100 forbs and 10 shrubs, B: 600 forbs and 200 shrubs)

The project scope of work is as follows:

- Spring 2016 (February/March/April)
  - A. BSB to Release Request for Quotes to procure vegetation to augment MTNPP plants
  - B. BSB to Prepare Planting Areas
  - C. BSB to Seed or Hydroseed Planting Areas
  - D. MTNPP hand seeds some sites
- Fall 2016 (September/October)
  - E. MTNPP hand preparation for installation of forbs and shrubs.
  - F. MTNPP to plant forbs and shrubs

**Efforts to Co-ordinate with other Entities:** Montana Tech Native Plant Program and Butte-Silver Bow Superfund Division have partnered in this effort collaboratively. Site visits have been conducted in tandem and plans for sites have been developed to minimize duplicate expenditures and maximize investment of Butte Natural Resource Damage grant funds for both the Native Plant and Butte Hill Tree planting programs. Butte-Silver Bow has agreed to prepare sites for Montana Tech, seed the sites with the EPA approved native seed mix, and assist where necessary. Butte-Silver Bow has committed funds to procuring larger vegetation to augment MTNPP plants and maximize sediment control measures on sites.

**Materials and Labor Estimate: Materials:** 910 containers of forbs and shrubs, 3 ounces native seed. Labor estimate for planting: 91 hrs

**Estimated Cost:** \$18,200 (including collection of seeds and cuttings, cleaning seeds, preparation/propagation of plants, planting, and maintaining)

**Proposed Start Date:** Fall 2016 **Proposed Evaluation Date:** June 2018

**Submitted by:** Montana Tech Native Plant Program



**Map of the Anselmo Timber Yard Slope**

## **Butte Area One Native Plant Diversity Site Improvement Plan**

**Site Name:** BA&P Trail at Montana Street; BA&P Trail at Main Street     **Date:** 01/01/2016

**Site Location/Size:** The planting targets are intended for the areas just east and west of the BA&P Trail underpasses at Montana and Main Streets (see map below).

**GPS:** 46 01 05.15 N; 112 32 24.74 W; 46 01 10.10 N; 112 32 09.09 W

**BRES Site #/Name:** Site No. 2330 BA&P Trail Section A

**BSB Zoning Classification(s) at Site:** Site No. 2330 is zoned OSD Open Space Developable

**Vegetative Deficiencies/Problems at this Site:** The BA&P Trail traverses through many neighborhoods and, in the case of this proposal, under major arterials Montana Street and Main Street. In these particular locations, the BA&P Rail Line's grade is maintained despite the steep slope of the Butte Hill, and in many areas the rail line cuts directly into the landscape. The engineered grade weaves through exposed rock outcrops, which happen to be just east and west of both bridges. The slopes in these areas are substantial, with a nearly vertical arrangement of rock outcrop or retaining walls anchoring significant volumes of decomposed granite. In the case of the underpass at Montana Street the side walls of the trail are eroding sediments onto the trail system which then convey across the trail. These sediments are carried by pedestrian activity and stormwater. The sediments then migrate onto BRES sites in the vicinity.

Plant species composition does not represent local, native species diversity. Mainly monocultures of Eurasian grass species and exotic weeds are present.

**Proposed Efforts to Improve the Site:** The plantings intended for this site are specifically designed for harsh landscapes with minimal soils, dry conditions, and rock formations. This proposal will establish vegetation cover where possible, reinforce lime rock applications in the area, preserve the fence that keeps patrons from climbing the walls yet currently serves as a retaining wall, and further mitigate sediment erosion into the stormwater system. Four planting areas are intended Site A is the west side of the trail crossing at Montana; Site B is the east side of the trail crossing at Montana; Site C is the west side of the trail crossing Main; and Site D is the west side of the trail crossing Main.

### **Site A. West side of BA&P Trail at Montana Street.**

The project will occur in two phases. In the spring of 2016, Butte-Silver Bow will hydroseed the slopes with drought-tolerant grass species including *Festuca idahoensis* (Idaho Fescue), *Poa sandbergii* (Sandberg's Bluegrass), *Koeleria cristata* (Prairie Junegrass). In the fall, MTNPP will plant 135 plants per site that will augment the grass seeds planted in the spring. Shrub species intended for installation include *Juniperus communis* (Common Juniper), *Juniperus scopulorum* (Rocky Mountain Juniper), *Cercocarpus ledifolius* (Curlleaf Mountain Mahogany), *Artemisia tridentata* (Big Sagebrush), *Chrysothamnus nauseosus* (Rubber Rabbitbrush). Twenty of each forb species including *Phacelia hastata* (Silky Phacelia), *Grindelia squarrosa* (Curlycup Gumweed), *Chaenactis douglasii* (Douglas' Dustymaiden), *Cryptantha interrupta* (Miner's

Candle), *Arabis holboellii* (Holboell's Rockcress), *Mentzelia laevicaulis* (Smootstem Blazingstar) will be planted.



**Site A. West side of BA&P Trail at Montana Street**

**BSB** prepares and hydroseeds sites

**MTNPP** plantings (A: 120 forbs and 15 shrubs)

**Site B. East side of BA&P Trail at Montana Street.**

The project will occur in two phases. In the spring of 2016, Butte-Silver Bow will hydroseed the slopes with drought-tolerant grass species including *Festuca idahoensis* (Idaho Fescue), *Poa sandbergii* (Sandberg's Bluegrass), *Koeleria cristata* (Prairie Junegrass). In the fall, MTNPP will plant 135 plants that will augment the grass seeds planted in the spring. Shrub species intended for installation include *Juniperus communis* (Common Juniper), *Juniperus scopulorum* (Rocky Mountain Juniper), *Cercocarpus ledifolius* (Curleaf Mountain Mahogany), *Artemisia tridentata* (Big Sagebrush), *Chrysothamnus nauseosus* (Rubber Rabbitbrush). Twenty of each forb species including *Phacelia hastata* (Silky Phacelia), *Grindelia squarrosa* (Curlycup Gumweed), *Chaenactis douglasii* (Douglas' Dustymaiden), *Cryptantha interrupta* (Miner's Candle), *Arabis holboellii* (Holboell's Rockcress), *Mentzelia laevicaulis* (Smootstem Blazingstar) will be planted.



**Site B. East side of BA&P Trail at Montana Street**

**BSB** prepares and hydroseeds sites

**MTNPP** plantings (A: 120 forbs and 15 shrubs)

### Site C. West side of BA&P Trail at Main Street.

The project will occur in two phases. In the spring of 2016, Butte-Silver Bow will hydroseed the slopes with drought-tolerant grass species including *Festuca idahoensis* (Idaho Fescue), *Poa sandbergii* (Sandberg's Bluegrass), *Koeleria cristata* (Prairie Junegrass). In the fall, MTNPP will plant 135 plants that will augment the grass seeds planted in the spring. Shrub species intended for installation include *Juniperus communis* (Common Juniper), *Juniperus scopulorum* (Rocky Mountain Juniper), *Cercocarpus ledifolius* (Curleaf Mountain Mahogany), *Artemisia tridentata* (Big Sagebrush), *Chrysothamnus nauseosus* (Rubber Rabbitbrush). Twenty of each forb species including *Phacelia hastata* (Silky Phacelia), *Grindelia squarrosa* (Curlycup Gumweed), *Chaenactis douglasii* (Douglas' Dustymaiden), *Cryptantha interrupta* (Miner's Candle), *Arabis holboellii* (Holboell's Rockcress), *Mentzelia laevicaulis* (Smootstem Blazingstar) will be planted.



### Site C. West side of BA&P Trail at Main Street

**BSB** prepares and hydroseeds sites

**MTNPP** plantings (A: 120 forbs and 15 shrubs)

### Site D. East side of BA&P Trail at Main Street.

The project will occur in two phases. In the spring of 2016, Butte-Silver Bow will hydroseed the slopes with drought-tolerant grass species including *Festuca idahoensis* (Idaho Fescue), *Poa sandbergii* (Sandberg's Bluegrass), *Koeleria cristata* (Prairie Junegrass). In the fall, MTNPP will plant 135 plants that will augment the grass seeds planted in the spring. Shrub species intended for installation include *Juniperus communis* (Common Juniper), *Juniperus scopulorum* (Rocky Mountain Juniper), *Cercocarpus ledifolius* (Curleaf Mountain Mahogany), *Artemisia tridentata* (Big Sagebrush), *Chrysothamnus nauseosus* (Rubber Rabbitbrush). Twenty of each forb species including *Phacelia hastata* (Silky Phacelia), *Grindelia squarrosa* (Curlycup Gumweed), *Chaenactis douglasii* (Douglas' Dustymaiden), *Cryptantha interrupta* (Miner's Candle), *Arabis holboellii* (Holboell's Rockcress), *Mentzelia laevicaulis* (Smootstem Blazingstar) will be planted.



**Site D. East side of BA&P Trail at Main Street**  
**BSB** prepares and hydroseeds sites  
**MTNPP** plantings (2x 120 forbs and 2x 15 shrubs)

The project scope of work is as follows:

- Spring 2016 (February/March/April)
  - A. BSB to Release Request for Quotes to procure vegetation to augment MTNPP plants
  - B. BSB to Prepare Planting Areas
  - C. BSB to Hydroseed Planting Areas
- Fall 2016 (September/October)
  - D. MTNPP hand preparation for installation of forbs and shrubs.
  - E. MTNPP to plant forbs and shrubs

**Efforts to Co-ordinate with other Entities:** Montana Tech Native Plant Program and Butte-Silver Bow Superfund Division have partnered in this effort collaboratively. Site visits have been conducted in tandem and plans for sites have been developed to minimize duplicate expenditures and maximize investment of Butte Natural Resource Damage grant funds for both the Native Plant and Butte Hill Tree planting programs. Butte-Silver Bow has agreed to prepare sites for Montana Tech, seed the sites with the EPA approved native seed mix, and assist where necessary. Butte-Silver Bow has committed funds to procuring larger vegetation to augment MTNPP plants and maximize sediment control measures on sites.

**Materials and Labor Estimate: Materials:** 1000 containers of forbs and shrubs, 3 ounces native seed. Labor estimate for planting: 100 hrs

**Estimated Cost:** \$20,000 (including collection of seeds and cuttings, cleaning seeds, preparation/propagation of plants, planting, and maintaining)

**Proposed Start Date:** Fall 2016 Proposed Evaluation Date: June 2018

Submitted by: Montana Tech Native Plant Program



Map of the Ba&P Trail at Montana Street



Map of the Ba&P Trail at Main Street

## Butte Area One Native Plant Diversity Site Improvement Plan

**Site Name:** Site No. 96, Washoe Dump

**Date:** 01/01/2016

**Site Location/Size:** The planting targets is located at the South West intersection of Copper and Arizona Streets (see map below).

**GPS:** 46 00 57.76 N; 112 31 58.72 W

**BRES Site #/Name:** Site No. 96 Washoe Dump

**BSB Zoning Classification(s) at Site:** The Site is zoned C3 – Central Commercial owned by Butte-Silver Bow. The lot is not developable as it is within the vision clearance triangle, which is not buildable to allow for vision clearance for drivers approaching this intersection.

**Vegetative Deficiencies/Problems at this Site:** The site itself has relatively good vegetation scores and erosion scores. However, the site does have some subsidence issues and is frequently inundated with sediments in stormwater running toward the site from Wyoming Street and Anaconda Road. The sediments enter the site and cause deposition and erosion. Slowing stormwater is a priority.

Plant species composition does not represent local, native species diversity. Mainly monocultures of Eurasian grass species and exotic weeds are present.

**Proposed Efforts to Improve the Site:** The site will be attended to in two phases; firstly, Butte-Silver Bow will scrape off two 3x10m stripes and seed the sites with the 2015 EPA-approved Pal mix (additional forb seeds will be added by MTNPP such as *Linum lewisii* (Lewis' Flax), *Artemisia ludoviciana* (White Sage), *Arabis holboellii* (Holboell's Rockcress), *Antennaria microphylla* (Pussytoes), *Coreopsis tinctoria* (Plains Coreopsis), *Erigeron compositum* (Cutleaf Daisy), *Achillea millefolium* (Yarrow). Additional Butte-Silver Bow will plant in 30 bigger (1-5 gallon) rocky mountain junipers next to road. Montana Tech Native Plant Program will plant 300 forbs and 20 shrubs on the site.

Shrub species: *Juniperus communis* (Common Juniper), *Juniperus scopulorum* (Rocky Mountain Juniper), *Cercocarpus ledifolius* (Curlleaf Mountain Mahogany), *Artemisia tridentata* (Big Sagebrush), *Chrysothamnus nauseosus* (Rubber Rabbitbrush).

Forb species: *Allium cernuum* (Nodding Onion), *Epilobium angustifolium* (Fireweed), *Arenaria congesta* (Ballhead Sandwort), *Artemisia frigida* (Fringed Sage), *Aster occidentalis* (Western Mountain Aster), *Astragalus atropubescens* (Hangingpod Milkvetch), *Balsamorhiza sagittata* (Arrowleaf Balsamroot), *Oxytropis lagopus* (Rabbitsfoot Locoweed), *Eriogonum ovalifolium* (Cushion Buckwheat), *Lupinus* species (Lupine), *Grindelia squarrosa* (Curlycup Gumweed), *Heterotheca villosa* (Hairy False Goldenaster), *Hymenoxys acaulis* (Stemless Four-nerve Daisy), *Lithospermum ruderales* (Puccoon), *Mentzelia laevicaulis* (Smoothstem Blazingstar), *Oenothera biennis* (Common Evening Primrose), *Penstemon eriantherus* (Fuzzytongue Penstemon), *Phlox*

*muscooides* (Moss Phlox), *Phacelia hastata* (Silky Phacelia), *Potentilla gracilis* (Slender Cinquefoil), *Potentilla pensylvanica* (Pennsylvania Cinquefoil), *Solidago missouriensis* (Missouri Goldenrod), *Sedum lanceolatum* (Spearleaf stonecrop), *Geum triflorum* (Old Man's Whiskers), *Astragalus crassicaarpus* (Groundplum Milkvetch), *Arnica* species (Arnica), *Heuchera cylindrica* (Roundleaf Alumroot), *Phlox longifolia* (Longleaf Phlox), *Agoseris glauca* (False Mountain Dandelion).

**Seed in of grasses and forbs.** Grass species: *Festuca idahoensis* (Idaho Fescue), *Poa sandbergii* (Sandberg's Bluegrass), *Festuca scabrella* (Rough Fescue). Forb species: *Linum lewisii* (Lewis' Flax), *Artemisia ludoviciana* (White Sage), *Arabis holboellii* (Holboell's Rockcress), *Antennaria microphylla* (Pussytoes), *Coreopsis tinctoria* (Plains Coreopsis), *Erigeron compositum* (Cutleaf Daisy), *Achillea millefolium* (Yarrow).



#### Washoe Site

**Yellow:** BSB tree planting 30 shrubs

**Red:** Montana Tech Native Plant Program sites (2x 300 forbs and 2x 20 shrubs)

The project scope of work is as follows:

- Spring 2016 (February/March/April)
  - A. BSB to Release Request for Quotes to procure vegetation to augment MTNPP plants
  - B. BSB to Prepare Planting Areas
  - C. BSB to Seed or Hydroseed Planting Areas
  - D. MTNPP Hand Seed Certain Forbs
- Fall 2016 (September/October)
  - E. MTNPP hand preparation for installation of forbs and shrubs.
  - F. MTNPP to plant forbs and shrubs

**Efforts to Co-ordinate with other Entities:** Montana Tech Native Plant Program and Butte-Silver Bow Superfund Division have partnered in this effort collaboratively. Site visits have been conducted in tandem and plans for sites have been developed to minimize duplicate expenditures and maximize investment of Butte Natural Resource Damage grant funds for both the Native Plant and Butte Hill Tree planting programs. Butte-Silver Bow has agreed to prepare sites for Montana Tech, seed the sites with the EPA approved native seed mix, and assist where necessary. Butte-Silver Bow has committed funds to procuring larger vegetation to augment MTNPP plants and maximize sediment control measures on sites.

**Materials and Labor Estimate: Materials:** 640 containers of forbs and shrubs, 3 ounces native seed. Labor estimate for planting: 64 hrs

**Estimated Cost:** \$12,4800 (including collection of seeds and cuttings, cleaning seeds, preparation/propagation of plants, planting, and maintaining)

**Proposed Start Date:** Fall 2016 **Proposed Evaluation Date:** June 2018

**Submitted by:** Montana Tech Native Plant Program



**Map of the Washoe Dump planting plan**

## **Butte Area One Native Plant Diversity Site Improvement Plan**

**Site Name:** Site No. 78, Original Mine Yard.

**Date:** 01/01/2016

**Site Location/Size:** The site contains two planting targets, one along the southern boundary (fence line) and the other is to the north east side of the lower access gate from Main Street (see map below).

**GPS:** 46 01 00.60 N; 112 32 12.82 W

**BRES Site #/Name:** Site No. 78, Original Mine Yard.

**BSB Zoning Classification(s) at Site:** The Site is zoned OSD – Open Space Developable and the site is owned by Butte-Silver Bow.

**Vegetative Deficiencies/Problems at this Site:** The Original Mine Yard is unique in that its vegetative cap is a combination of sod (in the amphitheater) and remedy grasses. For the purposes of this project, the area of the site being discussed is the fence line to the south. This area is extremely susceptible to erosion due to stormwater interaction; stormwater flows throughout the site have caused significant erosion and subsequently sedimentation along the southern portion of the site, along the fence line. To minimize this erosion, and in particular erosion into the streets and the stormwater system, we intend to establish a tree lined boundary along the southern fence line. This investment is intended to minimize impairment to the vista from the site, but retain sediments on site and minimize flows into the stormwater system. Plant species composition does not represent local, native species diversity. Mainly monocultures of Eurasian grass species and exotic weeds are present.

**Proposed Efforts to Improve the Site:** The site contains two distinct planting areas Site A and Site B. Site A will be planted with 100 *Juniperus scopularum* (Rocky Mountain Juniper) along the southern fence line. Site B will be planted with approximately 30 drought-tolerant shrubs such as *Rosa woodsii* (Wood's Rose), *Chrysothamnus viscidiflorus* (Green Rabbitbrush), and *Artemisia tridentata* (Big Sagebrush).

The project scope of work is as follows:

- Spring 2016 (February/March/April)
  - A. BSB to Release Request for Quotes to procure vegetation to augment MTNPP plants
  - B. BSB to Prepare Planting Areas
- Fall 2016 (September/October)
  - C. MTNPP & BSB to install shrubs and trees.



**BSB** plants 30 „bigger” *Juniperus scopularum* (Rocky Mountain Junipers) along the fence  
**MTNPP** will plant 30 dry tolerant shrubs at the designated site *Rosa woodsii* (Wood’s Rose),  
*Chrysothamnus viscidiflorus* (Green Rabbitbrush), and *Artemisia tridentata* (Big Sagebrush)

**Efforts to Co-ordinate with other Entities:** Montana Tech Native Plant Program and Butte-Silver Bow Superfund Division have partnered in this effort collaboratively. Site visits have been conducted in tandem and plans for sites have been developed to minimize duplicate expenditures and maximize investment of Butte Natural Resource Damage grant funds for both the Native Plant and Butte Hill Tree planting programs. Butte-Silver Bow has agreed to prepare sites for Montana Tech, seed the sites with the EPA approved native seed mix, and assist where necessary. Butte-Silver Bow has committed funds to procuring larger vegetation to augment MTNPP plants and maximize sediment control measures on sites.

**Materials and Labor Estimate: Materials:** 30 containers of forbs and shrubs, 3 ounces native seed. Labor estimate for planting: 3 hrs

**Estimated Cost:** \$600 (including collection of seeds and cuttings, cleaning seeds, preparation/propagation of plants, planting, and maintaining)

**Proposed Start Date:** Fall 2016 **Proposed Evaluation Date:** June 2018

**Submitted by:** Montana Tech Native Plant Program



**Map of the Original Mine Yard planting plan**

## **Butte Area One Native Plant Diversity Site Improvement Plan**

**Site Name:** West Gagnon Dump, Site No. 74

**Date:** 01/01/2016

**Site Location/Size:** The West Gagnon Dump is a 2.75 acre BRES site bounded by Woolman Street to the North, Washington Street to the East, and Jackson Street to the East (see map below).

**GPS:** 46 01 02.07 N; 112 32 33.50 W

**BRES Site #/Name:** BRES Site No. 74; West Gagnon Dump

**BSB Zoning Classification(s) at Site:** The site is zoned OSC – Open Space Conservation.

**Vegetative Deficiencies/Problems at this Site:** The West Gagnon Dump was evaluated in 2014 by independent contractors. Overall, the site had little evidence of active erosion; however, there are areas where site edges, land slumps, and improper excavations have compromised the healing site. The site did have low vegetation scores, and the site requires seeding and fertilizing to maintain appropriate ground cover. In addition, weed control is required around the site edges. This is not unexpected. The West Gagnon's initial remedy was not reclaimed to the BRES standards although remediation did occur. For example, the soils in this area tend to be less nutrient dense because they are comprised of more decomposed granite. This is likely why site vegetation is sparse, particularly along the edges, which are frequently inundated by stormwater. Poor plant cover and loose sediment leads to active erosion into the street right of way. To minimize the erosion of sediments off site, the installation of several hundred seedlings are planned along with installation of native grasses and forbs. Plant species composition does not represent local, native species diversity. Mainly monocultures of Eurasian grass species and exotic weeds are present.

**Proposed Efforts to Improve the Site:** This project is a community planting project to celebrate Arbor and Earth Days. Montana Tech Native Plant Program (MTNPP), Butte-Silver Bow (BSB), MSU Extension, and the AmeriCorps Energy Corps have partnered to bring this project to the community. The plantings intended for this site mitigate sediment erosion from the Site into Washington and Jackson Streets by reinforcing the Site's vegetative cover with native plants, grasses and forbs.

Butte-Silver Bow Planning Department plans to augment the relatively low-nutrient soils with the scouring of four planting areas and adding fertilizer, mulch and the EPA-approved Pal seed mix. These areas will be graded to match the topography of the site, but small depressions will be made to allow water that does flow to be captured to the benefit of the plants.

The site topography flows from its high point on the north east at Woolman and Washington to the south east near Caledonia and Jackson Streets. The site is further bisected by a pedestrian-forged trail from North Washington Street to the BA&P Trail which lies to the north of the West

Gagnon. Due to the prevalence of foot traffic in this area, the trail will be further enhanced – widened with gravel - to encourage its use and by extension minimize foot traffic on non-designated trails which cause plant attrition and therefore erosion.

The four planting areas will be planted with species deemed appropriate for the site topography and conditions. The area to the north east will be planted with Doug Fir and Ponderosa Pine seedlings, which will acclimate more easily to the dry soils in that area. To the south east, Choke Cherry shrubs will be installed. This particular placement is intended to provide the shrubs the opportunity to take advantage of the southeasterly flow of water over the site. Finally, six stripes of approximately 3x10m will be prepared just east and west of the pedestrian trail for the placement of Woods Rose and Buffalo Berry shrubs.

The MTNPP native plant program plans to then install an additional 200 overwintering shrubs on the site with the help of community volunteers. These shrubs include the following species *Sheperdia*, *Ribes americanum*, *Ribes aureum*, *Rosa woodsii*, *Purshia tridentata*, *Cercocarpus ledifolius*. The MTNPP will also seed in a seed mix of dry tolerant forbs including *Linum lewisii*, *Achillea millefolium*, *Antennaria microphylla*, *Erigeron compositus*.



#### Groups of trees and shrubs by **BSB** and **NPP**

The project scope of work is as follows:

- Spring 2016 (February/March/April)
  - A. BSB to procure seedlings from DNRC nursery
  - B. Advertise the Community Planting; procure tools from BSB Parks & Recreation
  - C. BSB to Prepare Planting Areas (scour, fertilize)
  - D. Conduct Planting Day (April 22, 2016)
  - E. MTNPP to plant forbs and shrubs.

**Efforts to Co-ordinate with other Entities:** Montana Tech Native Plant Program and Butte-Silver Bow Superfund Division have partnered in this effort collaboratively. Site visits have been conducted in tandem and plans for sites have been developed to minimize duplicate expenditures and maximize investment of Butte Natural Resource Damage grant funds for both the Native Plant and Butte Hill Tree planting programs. Butte-Silver Bow has agreed to prepare sites for Montana Tech, seed the sites with the EPA approved native seed mix, and assist where necessary. Butte-Silver Bow has committed funds to procuring larger vegetation to augment MTNPP plants and maximize sediment control measures on sites.

**Materials and Labor Estimate: Materials:** 200 containers of forbs and shrubs, 3 ounces native seed. Labor estimate for planting: 20 hrs (depending on the number of volunteers that show up)

**Estimated Cost:** \$4,000 (including collection of seeds and cuttings, cleaning seeds, preparation/propagation of plants, planting, and maintaining)

**Proposed Start Date:** Spring 2016 **Proposed Evaluation Date:** June 2018

**Submitted by:** Montana Tech Native Plant Program



**Map of the West Gagnon plan**

## **Butte Area One Native Plant Diversity Site Improvement Plan**

**Site Name:** Anselmo Mine Yard

**Date:** 01/01/2016

**Site Location/Size:** The planting targets are located at the Anselmo Timber Yard Slope, which is located north of the BA&P Trail, South of Empire Street, and West of Boardman Street. The site will consist of two planting areas; one, a rock outcrop along the trail, and another, the south west facing eastern portion of the site (see map below).

**GPS:** 46 00 58.53 N; 112 32 50.65 W

**BRES Site #/Name:** Site No. 71, Anselmo Mine Yard.

**BSB Zoning Classification(s) at Site:** Site No. 71 is OSC Open Space Conservation.

**Vegetative Deficiencies/Problems at this Site:** The Anselmo Mine Yard sits atop the sub-surface Missoula Gulch drainage. The southern slope of the mine yard descends at quite an angle, which has caused significant sediment erosion from the site down gradient toward a large stormwater inlet on Caledonia Street. This stormwater inlet has several cubic yards of sediment accumulation, which is routinely removed, but a maintenance issue given the frequency the inlet requires sediment removal. The removal of these sediments are essential to minimizing loading to the stormwater conveyance system and minimizing sediment load to Silver Bow Creek. Plant species composition does not represent local, native species diversity. Mainly monocultures of Eurasian grass species and exotic weeds are present.

**Proposed Efforts to Improve the Site:** The plantings intended for this site mitigate sediment erosion from the Site into the Missoula Gulch stormwater inlet by positioning plants to slow the flow of water, contribute toward the integrity of the site remedy, and retain sediment to the greatest extent practical. The proposed planting involves the installation of creeping juniper and Rocky Mountain juniper both inside the mine yard and outside the mine yard fence line around the perimeter of the stormwater inlet. The total plant count is 100 1 to 5 gallon containerized creeping juniper to be installed by BSB. MTNPP will plant 50 smaller common junipers and 50 smaller creeping junipers to stabilize along the fence.

The project scope of work is as follows:

- Spring 2016 (February/March/April)
  - A. BSB to Release Request for Quotes to procure vegetation to augment MTNPP plant stock.
  - B. BSB to Prepare Planting Areas.
- Fall 2016 (September/October)
  - C. MTNPP hand preparation for installation of forbs and shrubs.
  - D. MTNPP to plant shrubs.



#### **Anselmo Site**

For erosion control **BSB will plant in 100 bigger** (1-5 gallon containers) *Juniperus horizontalis* (Creeping Juniper), while **MTNPP** will plant **50 smaller** (500 ml containers) *Juniperus communis* (Common Juniper) and 50 smaller *Juniperus horizontalis* (Creeping Juniper) to stabilize the area along the fence. Outside the fence will be *Juniperus horizontalis* (Creeping Juniper) and inside the fence will be *Juniperus scopularum* (Rocky Mountain Juniper).

**Efforts to Co-ordinate with other Entities:** Montana Tech Native Plant Program and Butte-Silver Bow Superfund Division have partnered in this effort collaboratively. Site visits have been conducted in tandem and plans for sites have been developed to minimize duplicate expenditures and maximize investment of Butte Natural Resource Damage grant funds for both the Native Plant and Butte Hill Tree planting programs. Butte-Silver Bow has agreed to prepare sites for Montana Tech, seed the sites with the EPA approved native seed mix, and assist where necessary. Butte-Silver Bow has committed funds to procuring larger vegetation to augment MTNPP plants and maximize sediment control measures on sites.

**Materials and Labor Estimate: Materials:** 100 containers of forbs and shrubs, 3 ounces native seed. Labor estimate for planting: 10 hrs

**Estimated Cost:** \$2,000 (including collection of seeds and cuttings, cleaning seeds, preparation/propagation of plants, planting, and maintaining)

**Proposed Start Date:** Fall 2016 **Proposed Evaluation Date:** June 2018

**Submitted by:** Montana Tech Native Plant Program



**Map of the Anselmo Mine Yard plan**

## Butte Area One Native Plant Diversity Site Improvement Plan

**Site Name:** Travona Dump

**Date:** 01/01/2016

**Site Location/Size:** The planting areas are three 3 x 10 meter planting stripes in the Travona Mineyard/Dump (see map below).

**GPS:** 46 00 17.27 N; 112 32 42.67 W

**BRES Site #/Name:** Site No. 121, Travona Dump

**BSB Zoning Classification(s) at Site:** Zoned OSC – Open Space Conservation.

**Vegetative Deficiencies/Problems at this Site:** The Travona Dump was evaluated in June of 2014. At that time, the site showed 45% live ground cover, but quite a bit of plant litter, pedestalling and thus erratic flow patterns and surface rock movement. The site edges have more weeds and increased erosion. Exposed waste was reported in some areas, which has been excavated, and those excavated areas have been covered with lime rock, EPA-approved soils, and seed. The evaluators noticed that the majority of erosion and exposed waste exists on the southern slopes of the site, and is typical of sites with litter and pedestalling of plants, which cannot retain sediments due to poor ground cover.

Plant species composition does not represent local, native species diversity. Mainly monocultures of Eurasian grass species and exotic weeds are present.

**Proposed Efforts to Improve the Site:** The plantings intended for this site are specifically designed for south facing slopes. Three stripes measuring 3x10m will be created utilizing BSB's harrow. BSB will then seed the sites with the Pal 2015 seed mix in early spring (in addition forb seeds will be amended to enhance diversity such as *Linum lewisii* (Lewis' Flax), *Artemisia ludoviciana* (White Sage), *Arabis holboellii* (Holboell's Rockcress), *Antennaria microphylla* (Pussytoes), *Coreopsis tinctoria* (Plains Coreopsis), *Erigeron compositum* (Cutleaf Daisy), *Achillea millefolium* (Yarrow). MTNPP will then plant 300 forbs and 200 shrubs per site. The planting sites will become demonstration areas and will take advantage of the prevailing winds to spread seeds from native plants installed on the site.

Shrub species: *Juniperus communis* (Common Juniper), *Juniperus scopulorum* (Rocky Mountain Juniper), *Cercocarpus ledifolius* (Curlleaf Mountain Mahogany), *Artemisia tridentata* (Big Sagebrush), *Chrysothamnus nauseosus* (Rubber Rabbitbrush).

Forb species: *Allium cernuum* (Nodding Onion), *Epilobium angustifolium* (Fireweed), *Arenaria congesta* (Ballhead Sandwort), *Artemisia frigida* (Fringed Sage), *Aster occidentalis* (Western Mountain Aster), *Astragalus atropubescens* (Hangingpod Milkvetch), *Balsamorhiza sagittata* (Arrowleaf Balsamroot), *Oxytropis lagopus* (Rabbitsfoot Locoweed), *Eriogonum ovalifolium* (Cushion Buckwheat), *Lupinus* species (Lupine), *Grindelia squarrosa* (Curlycup Gumweed),



**BSB** prepares and seeds in sites  
**MTNPP** plantings (3x 300 forbs and 3x 200 shrubs / site)

*Heterotheca villosa* (Hairy False Goldenaster), *Hymenoxys acaulis* (Stemless Four-nerve Daisy), *Lithospermum ruderales* (Puccoon), *Mentzelia laevicaulis* (Smoothstem Blazingstar), *Oenothera biennis* (Common Evening Primrose), *Penstemon eriantherus* (Fuzzytongue Penstemon), *Phlox muscoides* (Moss Phlox), *Phacelia hastata* (Silky Phacelia), *Potentilla gracilis* (Slender Cinquefoil), *Potentilla pennsylvanica* (Pennsylvania Cinquefoil), *Solidago missouriensis* (Missouri Goldenrod), *Sedum lanceolatum* (Spearleaf stonecrop), *Geum triflorum* (Old Man's Whiskers), *Astragalus crassicaarpus* (Groundplum Milkvetch), *Arnica* species (Arnica), *Heuchera cylindrica* (Roundleaf Alumroot), *Phlox longifolia* (Longleaf Phlox), *Agoseris glauca* (False Mountain Dandelion).

The project scope of work is as follows:

- Spring 2016 (March/April)
  - F. BSB to Prepare Planting Areas
  - G. BSB to Hydroseed Planting Areas
- Fall 2016 (September/October)
  - H. MTNPP hand preparation for installation of forbs and shrubs.
  - I. MTNPP to plant forbs and shrubs

**Efforts to Co-ordinate with other Entities:** Montana Tech Native Plant Program and Butte-Silver Bow Superfund Division have partnered in this effort collaboratively. Site visits have been conducted in tandem and plans for sites have been developed to minimize duplicate expenditures and maximize investment of Butte Natural Resource Damage grant funds for both the Native

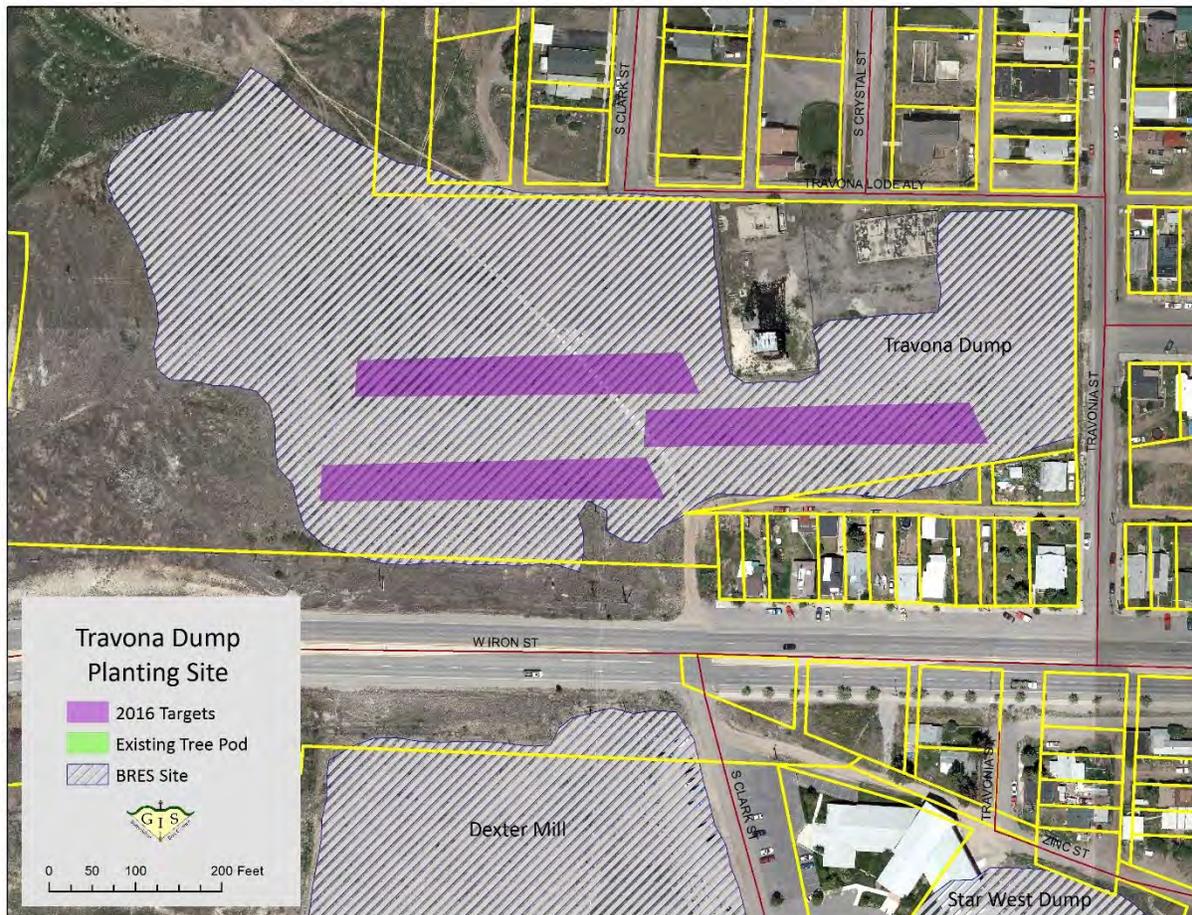
Plant and Butte Hill Tree planting programs. Butte-Silver Bow has agreed to prepare sites for Montana Tech, seed the sites with the EPA approved native seed mix, and assist where necessary. Butte-Silver Bow has committed funds to procuring larger vegetation to augment MTNPP plants and maximize sediment control measures on sites.

**Materials and Labor Estimate: Materials:** 1500 containers of forbs and shrubs, 3 ounces native seed. Labor estimate for planting: 150 hrs

**Estimated Cost:** \$30,000 (including collection of seeds and cuttings, cleaning seeds, preparation/propagation of plants, planting, and maintaining)

**Proposed Start Date:** Fall 2016 **Proposed Evaluation Date:** June 2018

**Submitted by:** Montana Tech Native Plant Program



**Map of the Travona Dump plan**

## **Butte Area One Native Plant Diversity Site Improvement Plan**

**Site Name:** Stormwater Inlet at Clark between Copper and Quartz, south of Scown field

**Date:** 01/01/2016

**Site Location/Size:** The planting is located at Clark Street between Copper and Quartz Streets, directly south of Scown Field (see map below).

**GPS:** 46 00 54.72 N; 112 32 46.85 W

**BRES Site #/Name:** The site is not a BRES site; it is a stormwater control structure supporting the overall stormwater management on the Butte Hill.

**BSB Zoning Classification(s) at Site:** The site is a R2 zoned parcel owned by Butte-Silver Bow. This parcel includes the stormwater structure as well as the Scown Field and other Tree Pod locations. It is not buildable.

**Vegetative Deficiencies/Problems at this Site:** The site located at the terminus of Clark Street at Copper (Between Copper and Quartz) was found during a field evaluation to be in need of stormwater controls.

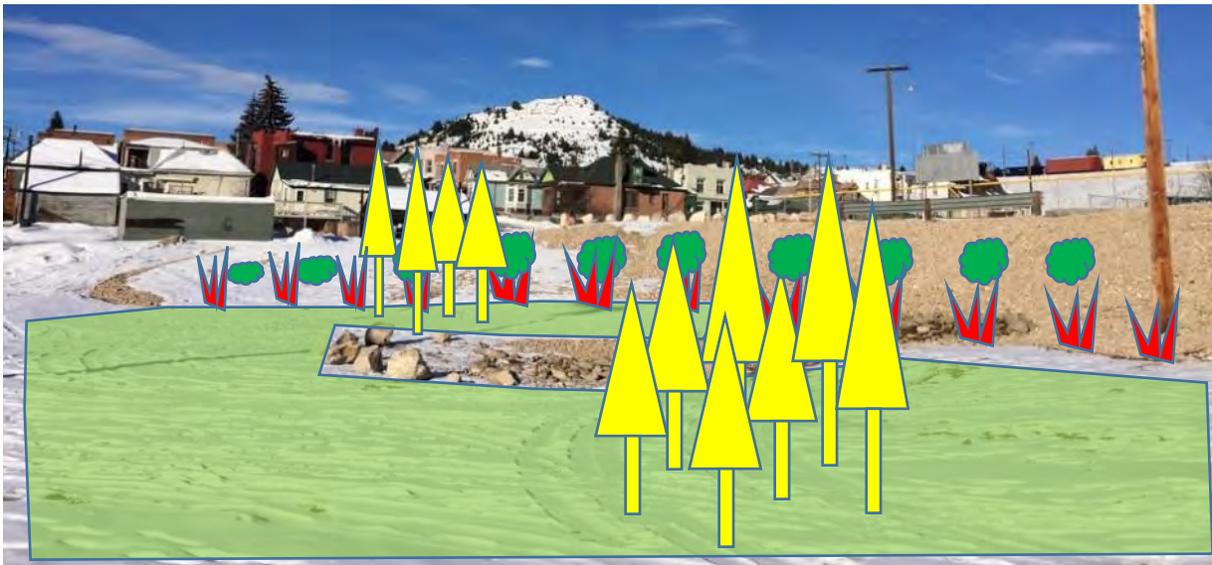
The base of the site is a wet area, and is intended to be so. Butte-Silver Bow recognizes the role vegetation enhancement has in our obligations to minimize sediment erosion and entry into the stormwater system. Therefore, the site design will allow for installation of shrubs, forbs, and grasses, while providing access area for Superfund Division maintenance crews to enter the area and conduct maintenance objectives.

Plant species composition does not represent local, native species diversity. Mainly monocultures of Eurasian grass species and exotic weeds are present.

**Proposed Efforts to Improve the Site:** In winter of 2015-16, Butte-Silver Bow Superfund Division regraded the slopes in this area and added rock to the slopes to minimize velocity of the run-off into the site to prevent future erosion issues. Within the site a new drop inlet was installed to catch stormwater that flows North off of Clark Street along with stormwater coming off of Copper Street. The remaining areas of the site will be vegetated. BSB will seed in Pal 2015 seedmix to the site and Montana Tech Native Plant Program will enhance it with some forbs such as: *Linum lewisii* (Lewis' Flax), *Artemisia ludoviciana* (White Sage), *Arabis holboellii* (Holboell's Rockcress), *Antennaria microphylla* (Pussytoes), *Coreopsis tinctoria* (Plains Coreopsis), *Erigeron compositum* (Cutleaf Daisy), *Achillea millefolium* (Yarrow).

BSB will plant in 2 groups (40 individuals) of bigger trees (1-5 gallon container)-as the site has more moisture from the stormwater drain. Tree species: Native cottonwood (*Populus*), Native willow (*Salix*).

Montana Tech plan to install 25 mountain mahogany, 25 creeping juniper and 50 woods rose shrubs on the slope around the base of the slope.



 40 Bigger trees (1-5 gallon containers) by **BSB**

 25 Mountain mahogany and 25 creeping juniper by **MTNPP**

 50 rose by **NPP**

 Pal 2015 grass seed mix with forbs seeded by **BSB**

The project scope of work is as follows:

- Spring 2016 (February/March/April)
  - A. BSB to Release Request for Quotes to procure vegetation to augment MTNPP plants
  - B. BSB to Prepare Planting Areas
  - C. BSB to Seed or Hydroseed Planting Areas
  - D. MTNPP will hand seed the additional forbs
- Fall 2016 (September/October)
  - E. MTNPP hand preparation for installation of forbs and shrubs.
  - F. MTNPP to plant forbs and shrubs

**Efforts to Co-ordinate with other Entities:** Montana Tech Native Plant Program and Butte-Silver Bow Superfund Division have partnered in this effort collaboratively. Site visits have been conducted in tandem and plans for sites have been developed to minimize duplicate expenditures and maximize investment of Butte Natural Resource Damage grant funds for both the Native Plant and Butte Hill Tree planting programs. Butte-Silver Bow has agreed to prepare sites for Montana Tech, seed the sites with the EPA approved native seed mix, and assist where

necessary. Butte-Silver Bow has committed funds to procuring larger vegetation to augment MTNPP plants and maximize sediment control measures on sites.

**Materials and Labor Estimate: Materials:** 100 containers of forbs and shrubs, 3 ounces native seed. Labor estimate for planting: 10 hrs

**Estimated Cost:** \$2,000 (including collection of seeds and cuttings, cleaning seeds, preparation/propagation of plants, planting, and maintaining)

**Proposed Start Date:** Fall 2016 Proposed Evaluation Date: June 2018

**Submitted by:** Montana Tech Native Plant Program



**Map of the Clark & Copper plan**

**Restoring Native Plant Diversity Project  
Montana Tech Budget (Loaded Rates)  
January 1, 2015 - December 31, 2016**

Expense Category	Budget		
<b>Salaries &amp; Wages:</b>	Rate	Hours	
Restoration Ecologist + PI - Robert Pal (11 months/20 hrs/wk)	\$43.46	954	\$ 41,463
Green House Manager - Krystal Weilage (9 months/40 hrs/wk)	\$19.61	2080	\$ 40,794
Grad student - Mark Mariano (40hrs/wk summer & 20 hrs/wk academic year)	\$18.75	1200	\$ 22,500
Undergrad students (2) (40 hrs/wk summer & 20 hrs/wk academic year)	\$12.50	1300	\$ 16,250
<b>Subtotal</b>			<b>\$ 121,007</b>

<b>Fringe Benefits:</b>			
Restoration Ecologist + PI (46% of salary)		0.46	\$ 19,073
Green House Manager (46% of salary)		0.46	\$ 18,765
Grad student ( 3% during school term/10% in summer)		0.07	\$ 1,575
Undergrad students (3% during school term/10% in summer)		0.07	\$ 1,138
<b>Subtotal</b>			<b>\$ 40,551</b>

<b>Other:</b>			
Contracted Services			\$ 625
Supplies/Materials			\$ 625
Communications			\$ 625
Travel			\$ 1,875
Other			\$ -
<b>Subtotal</b>			<b>\$ 3,750</b>

<b>Grand Total</b>			<b>\$ 165,308</b>
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